We claim:

1. A method of identifying fungicides, characterized in that

   (a) a polypeptide with the enzymatic activity of a mevalonate kinase is brought into contact with a chemical compound or a mixture of chemical compounds under conditions which permit the interaction of the chemical compound with the polypeptide,

   (b) the activity of the mevalonate kinase in the absence of the chemical compound is compared with the activity of the mevalonate kinase in the presence of the chemical compound or of the mixture of chemical compounds, and

   (c) the chemical compound which specifically inhibits mevalonate kinase is selected.

2. The method as claimed in claim 1, characterized in that

   (a) the ADP which is formed in the mevalonate kinase reaction is converted into ATP with the aid of a pyruvate kinase,

   (b) the resulting pyruvate is converted into lactate with the aid of a lactate dehydrogenase with consumption of NADH, and

   (c) the NADH consumption is monitored with the aid of a change in absorption.

3. The method as claimed in claim 2, characterized in that an inhibition of the enzymatic activity is determined from a lower increase in the ADP concentration.

4. The method as claimed in any of claims 1 to 3, characterized in that, in a further step, the fungicidal activity of the compound identified is tested by bringing it into contact with a fungus.

5. The method as claimed in any of claims 1 to 4, characterized in that a mevalonate kinase from a fungus is used.

6. The method as claimed in any of claims 1 to 5, characterized in that a mavalonate kinase from a phytopathogenic fungus is used.

7. A method of controlling phytopathogenic fungi, characterized in that an inhibitor of a fungal mevalonate kinase is allowed to act on the fungus or on the plant which is attacked by the fungus.

8. The use, as fungicides, of inhibitors of a polypeptide with the activity of a mevalonate kinase which are identified by a method as claimed in any of claims 1 to 4.

9. A nucleic acid coding for a polypeptide with the biological activity of mevalonate kinase, characterized in that it codes for a mevalonate kinase from *U. maydis*.

10. A nucleic acid from phytopathogenic fungi, characterized in that it comprises a sequence which is selected from among:

a) a sequence as shown in SEQ ID NO: 1,

b) sequences which code for a polypeptide which comprises the amino acid sequence as shown in SEQ ID NO: 2, and

c) sequences which have at least 90% identity with the sequences as defined under a) and b) and which code for the sequence motif [LIVM]-[PK]-x-[GSTA]-x(0,1)-G-[LM]-[GS]-S-S-[GSA]-[GSTAC].

11. A DNA construct comprising a nucleic acid as claimed in claim 9 or 10 and a heterologous promoter.

12. A vector comprising a nucleic acid as claimed in claim 9 or 10, or a DNA construct as claimed in claim 11.

13. The vector as claimed in claim 12, characterized in that the nucleic acid is linked functionally with regulatory sequences which ensure the expression of the nucleic acid in prokaryotic or eukaryotic cells.

14. A host cell comprising a nucleic acid as claimed in claim 9 or 10, a DNA construct as claimed in claim 11 or a vector as claimed in claim 12 or 13.

15. The host cell as claimed in claim 14, characterized in that it takes the form of a prokaryotic or eukaryotic cell.

16. A polypeptide with the biological activity of a mevalonate kinase which is encoded by a nucleic acid as claimed in claim 9 or 10.

17. A polypeptide with the biological activity of a mevalonate kinase which comprises an amino acid sequence as shown in SEQ ID NO: 2.